WORLD BANK ENGAGEMENT ON AIR QUALITY MANAGEMENT

Asia Development Bank Workshop on Scaling Support- Discussion with MDBs

Karin Shepardson, Lead Environmental Specialist and team leader for the India AQM Program

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Air Pollution is a significant development challenge

Countries often reach critical breaking points before a sustained effort is made to gain control

There is no quick fix. Capacity development is the #1 need in most countries to put the long-term critical building blocks in place

Countries require a sustained, multi-sector, and multi-jurisdiction (airshed) approach to decouple growth from air pollution

The science of air pollution continues to evolve, and investment approaches must too:

- Long-range and secondary emission sources are better understood today
- Technology and tools to understand and address the problem are expanding
- Inter-connections with other environmental challenges like climate change are becoming better understood

World Bank support for Air Quality Management spans over 30 years

Country		Period	Project	Key activities	Amount
Mexico	IPF	'94-'99	Transport and AQM	Vehicle, fuel, transport management, AQM planning	$220 mn
Mexico	DPL	'11-'13	Low-Carbon DPL	Policy reforms to RE, EE, Transport	$401 mn
Peru	DPL (3)	'09-'15	Environment DPLs	Policy reform on AQM, Contingency plan	$455 mn
China	P4R (2)	'16-'21	Hebei and JJJ Programs	EE, RE, industrial, HH, Agriculture	$1 bn
Vietnam	DPL	'16-'19	CC & Green Growth	Policy Reform on Initial AQM, vehicle emission control etc.	$90 mn
Bangladesh	IPF (3)	'00-'19	AQM and Clean Air Projects	AQM, vehicle, brick kilns	$101 mn
Pakistan	P4R	'18-'23	Punjab Green Development	AQM, EE, RECP	$200 mn

Ongoing Bank-Executed Technical Assistance in:

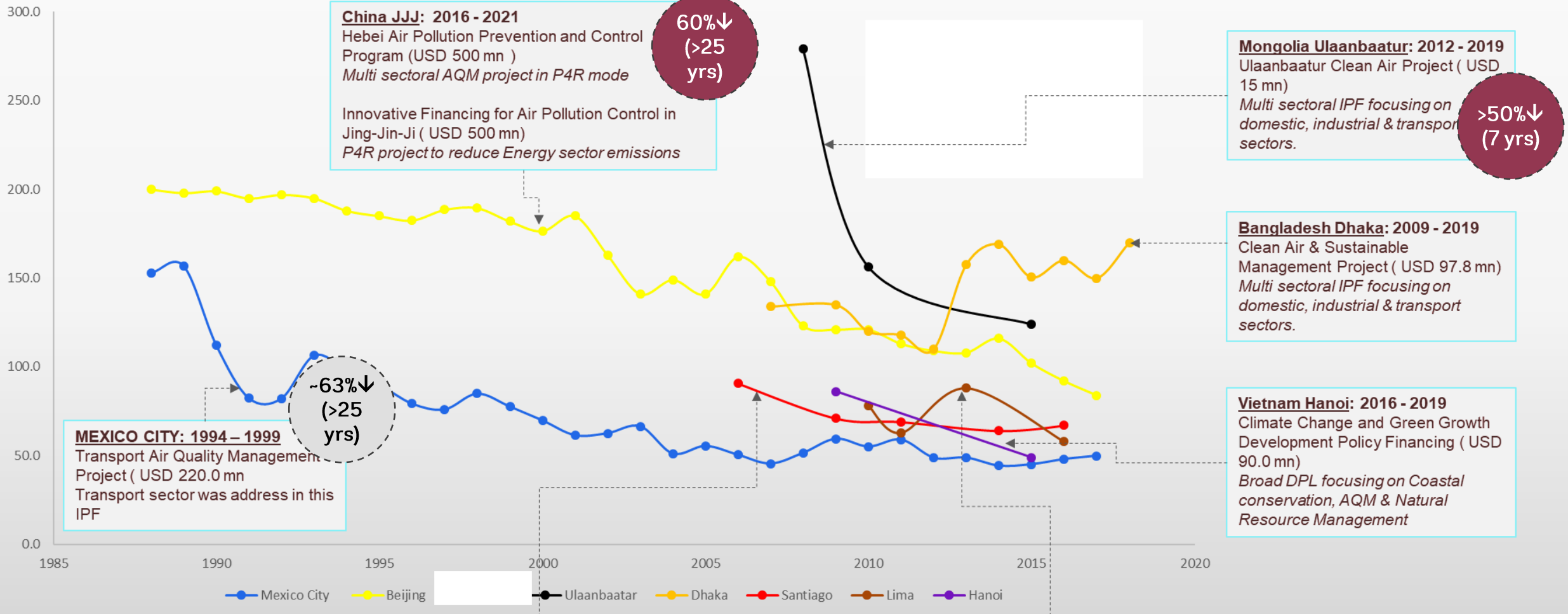
China; India; Egypt; Ghanna; Vietnam; South Africa; Nigeria; Bulgaria (EU funds)

A Global Practice supports knowledge sharing across teams and cross-fertilization through peer reviews

<u>Recent 2020 Loans:</u>

- **Egypt (IPF**) had a significant focus on waste management
- **Mexico (DPL)** – Climate and Air Quality linked and part of a COVID-19 response

EXAMPLES OF WORLD BANK SUPPORT CONTRIBUTING TO AIR QUALITY IMPROVEMENTS (Reductions in PM_{10} concentrations in select cities from 1985-2018)



China JJJ: 2016 - 2021
Hebei Air Pollution Prevention and Control Program (USD 500 mn)
Multi sectoral AQM project in P4R mode

Innovative Financing for Air Pollution Control in Jing-Jin-Ji (USD 500 mn)
P4R project to reduce Energy sector emissions

60%↓ (>25 yrs)

Mongolia Ulaanbaatur: 2012 - 2019
Ulaanbaatur Clean Air Project (USD 15 mn)
Multi sectoral IPF focusing on domestic, industrial & transport sectors.

>50%↓ (7 yrs)

Bangladesh Dhaka: 2009 - 2019
Clean Air & Sustainable Management Project (USD 97.8 mn)
Multi sectoral IPF focusing on domestic, industrial & transport sectors.

MEXICO CITY: 1994 – 1999
Transport Air Quality Management Project (USD 220.0 mn
Transport sector was address in this IPF

~63%↓ (>25 yrs)

Vietnam Hanoi: 2016 - 2019
Climate Change and Green Growth Development Policy Financing (USD 90.0 mn)
Broad DPL focusing on Coastal conservation, AQM & Natural Resource Management

21%↓ (10 yrs)

Chile Santiago: 2005 /06
Santiago Urban Transport Project (USD 30.2 +70.0 mn)
DPL focusing on the AQM and Transport service quality of Santiago city

Peru Lima: 2009
Environmental Development Policy Loan (USD 330 mn)
Multi sectoral DPL in Air Quality Monitoring, Transport, Fisheries and Mining Sectors.

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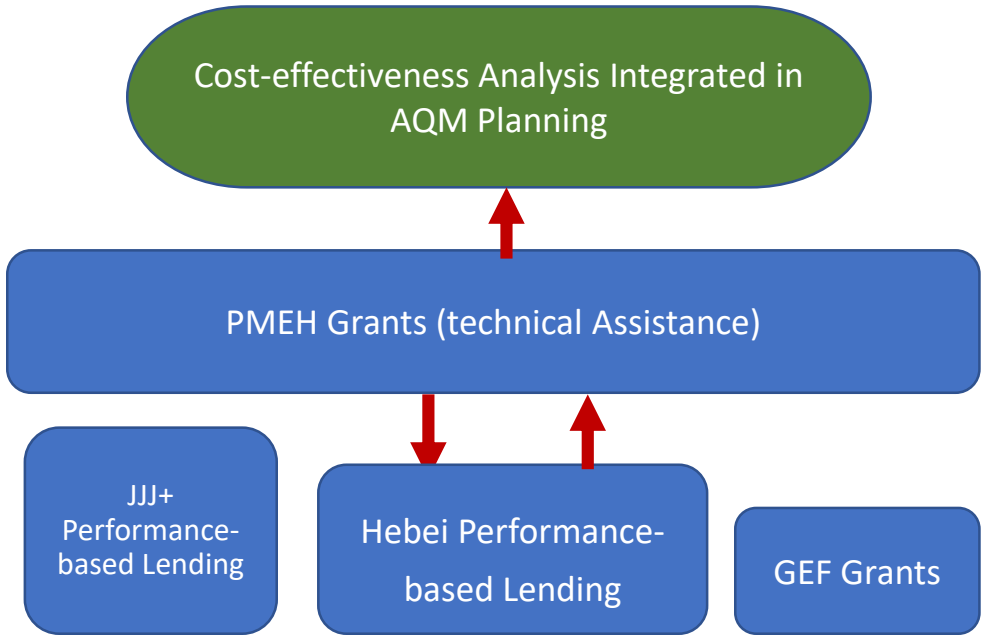
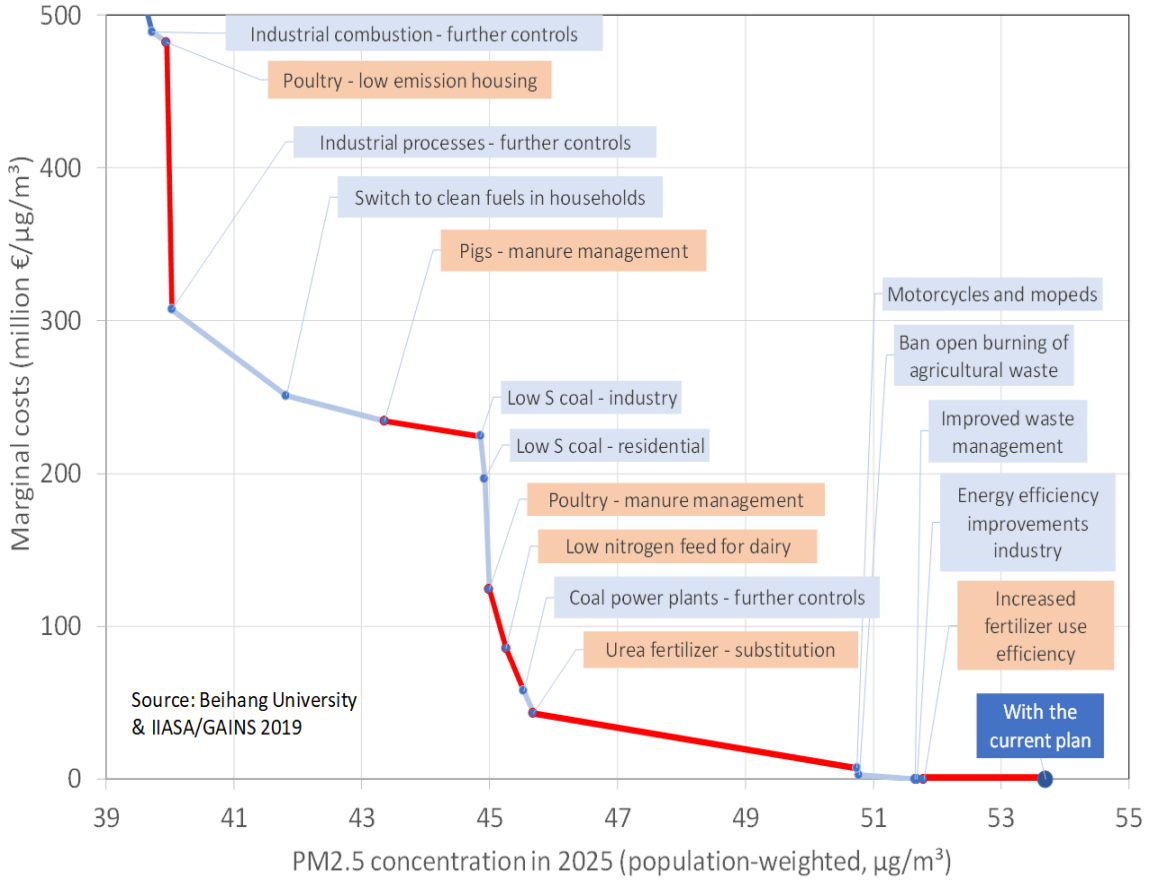
South Asia

The approach in China has been adapted to other countries

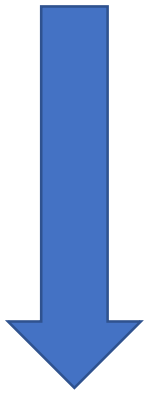
- Prioritized in the World Bank's Country Partnership Framework
- Use a combination of lending instruments and TA
- Support an expansion to airshed level planning
- Introduced cost-effectiveness modeling for integration in AQM plans for airshed regions (JJJ+Hebei)



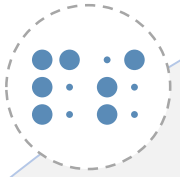


Building toward an airshed management planning approach

Many “no regret” sector specific measures can align well with climate change benefits



Build awareness & evidence base



Develop **Airshed Modelling** and fill analytic gaps on rural sources

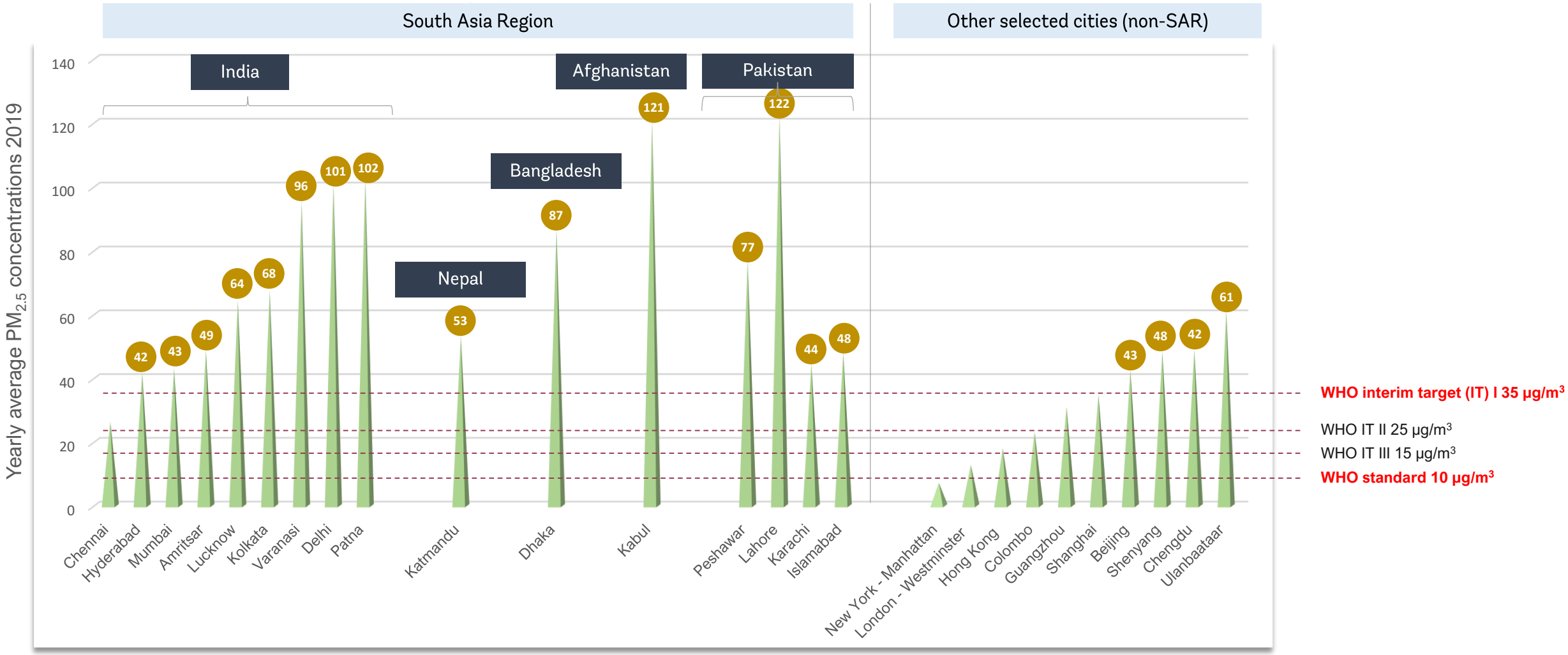
Introduce **reforms for airshed**-based AQM management

Develop state or Province level action plans and mobilize financing

Develop regional action plan and mechanisms for implementation

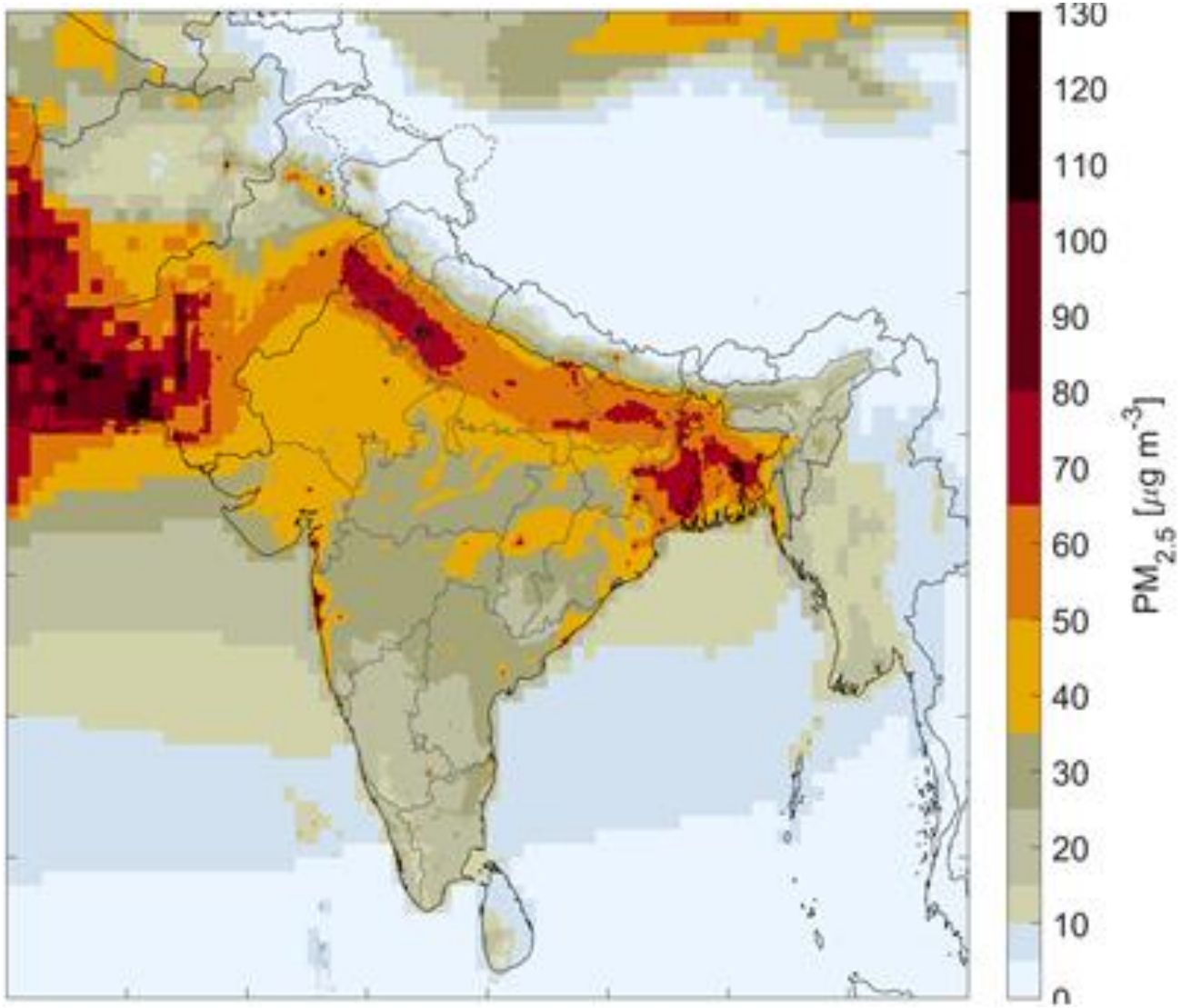
But to identify measures with highest cost effectiveness, cross-jurisdictional level planning with an understanding of secondary emissions is necessary

South Asia Region is a GLOBAL HOT SPOT FOR HIGH AIR POLLUTION (2019)
Most cities in the region are 3 – 12x higher than WHO standard for $PM_{2.5}$



Source: Calculations from 2019 AQ data from openaq.org and airnow.org

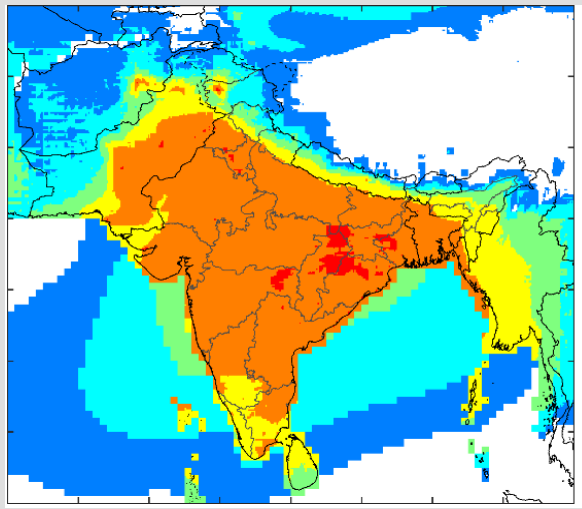
HIGHEST LEVELS OF UNHEALTHY AIR POLLUTION IN THE INDO-GANGETIC PLAIN (IGP) AND INDUS RIVER PLAIN



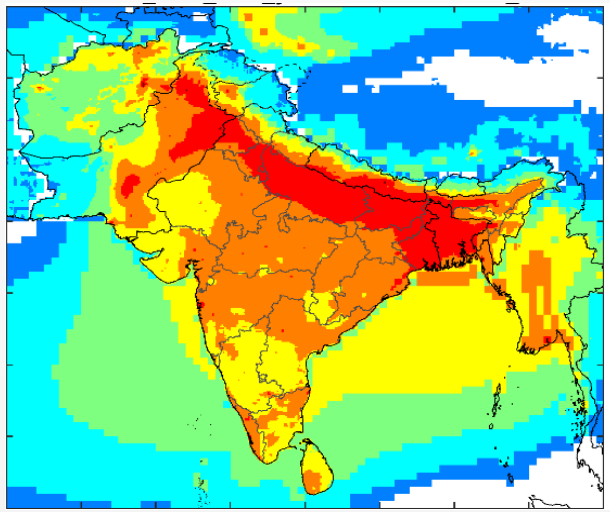
- Population in entire SAR area is exposed to $PM_{2.5}$ concentrations above WHO standards (except parts of Sri Lanka)
- In most cases, concentrations are substantively above WHO's interim target I (35 $\mu g/m^3$) and SAR countries own $PM_{2.5}$ air quality standards:

Country	Standards
Afghanistan	35 µg/m3 (WHO IT 1)
Bangladesh	15 µg/m3 (WHO IT 3)
India	40 µg/m3 (> WHO IT 1)
Nepal	n/a (40 µg/m3 daily concentration)
Pakistan	25 µg/m3 (WHO IT 2)
Sri Lanka	25 µg/m3 (WHO IT 2)

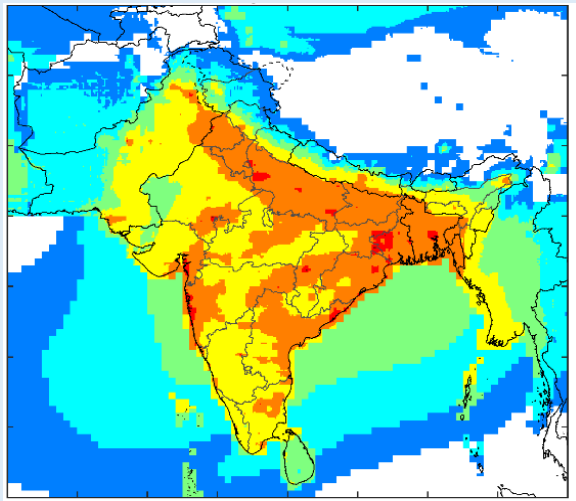
Modeling can improve the focus of effort



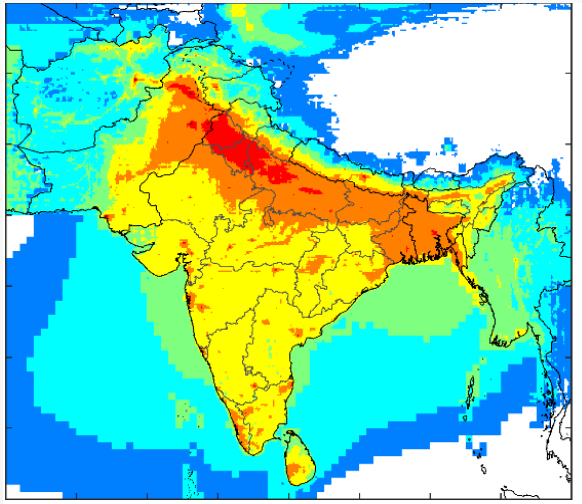
Power Generation



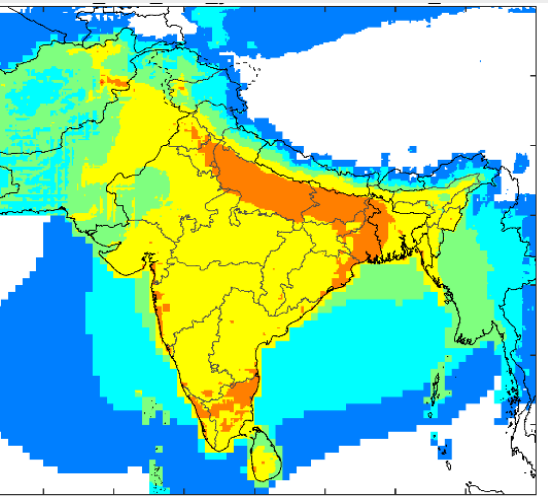
Residential and Commercial Sources



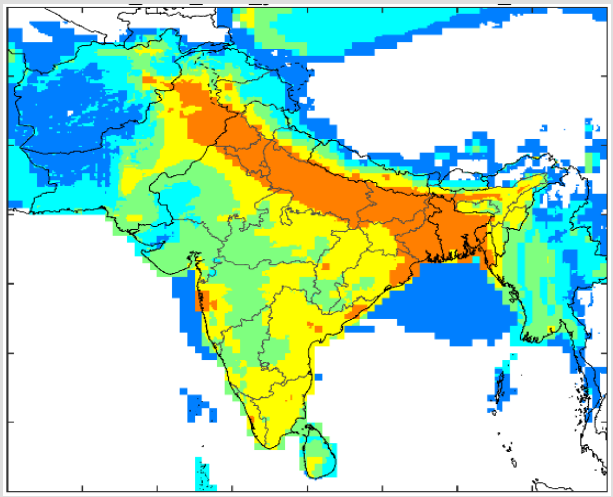
Large Industrial Sources (incl. Brick Kilns)



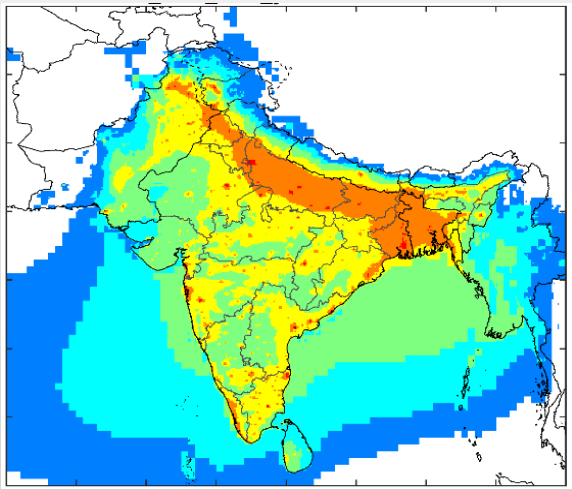
Mobile Sources (Transport)



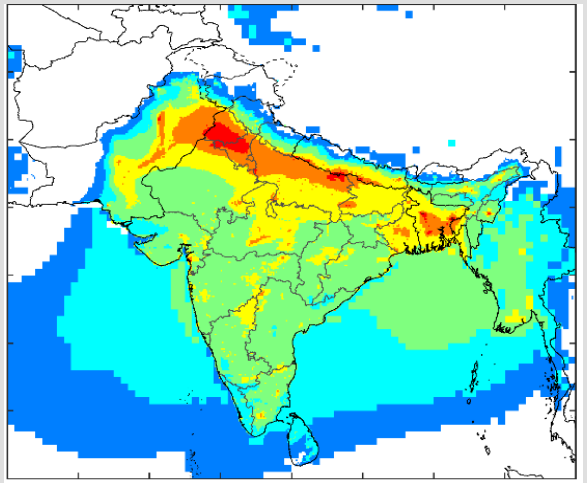
Small Industrial Sources



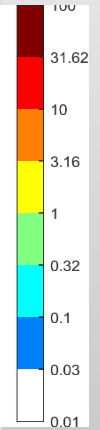
Other Agricultural Sources (fertilizer, manure)



Municipal Waste Burning



Agricultural Waste (crop residue) Sources



EXAMPLES OF "BUILDING BACK BETTER" RECOVERY MEASURES ACROSS KEY SECTORS

Power Generation

Continue improving de-dust, de-NOx and de-SOx installation in power plants

In certain hotspot areas, consider tightened emission standards

Enabling a green, least-cost energy system and system-wide energy efficiency

- Enable scaling of energy storage and demand response implementation through incentives and mechanism including building markets for ancillary services

Large Industrial sources

Continue improving de-dust, de-NOx and de-SOx installation in large industrial sources

Establish and accelerate Continuous Emissions Monitoring (CEM) installations in larger industrial clusters

Small Industrial sources

Promoting manual emission monitoring systems

In brick kilns, newer technologies like zig zag to be increasingly applied to reduce emissions from brick kilns

Establishment of smaller industrial parks, and zones

Residential and Commercial sources

Dedicated national clean cooking policies to transition and adapt to the best available stoves for local manufacture (Biogas, LPG, natural gas, etc.)

Government housing projects to align with green building standards

- Ensuring buildings are more energy efficient and supporting the circular economy.

Transportation

Sustaining and transitioning the temporary passenger mobility demand reduction to non-motorized, shared public transports

Incentives to boost EV uptake and streamline the freight sector and its supply chain

Incentive-based policies continue to encourage scrapping vehicles older than 10-15 years

Agricultural waste (crop residue)

In-situ or on-farm management of residues

- Promote conservation agriculture
- Recycle residues in the soil - build SOC & productive capacity

Explore new designs for combine harvesters suitable for no stubble and for double cropping systems
Involve the private sector for farm machinery solutions

Other Agriculture Sources

Cost-effectiveness of ammonia (NH_3) management an important part of AQM Planning

Need to pilot new technical solutions for NH_3 management in small scale farming in SAR region

Municipal Waste Burning

Take actions to improve existing disposal site in short to medium term

An opportunity in green recovery to seek greater circularity in supply chains, which can act both to improve resource efficiency as waste is minimized and end-of-life products are recovered for reuse, remanufacture, and recycling.

Dust

Green infrastructure measures can be extremely popular to reduce ozone and particulate pollution in population-dense cities.

Natural Dust

- Accelerate dust management technologies already underway in several SAR countries

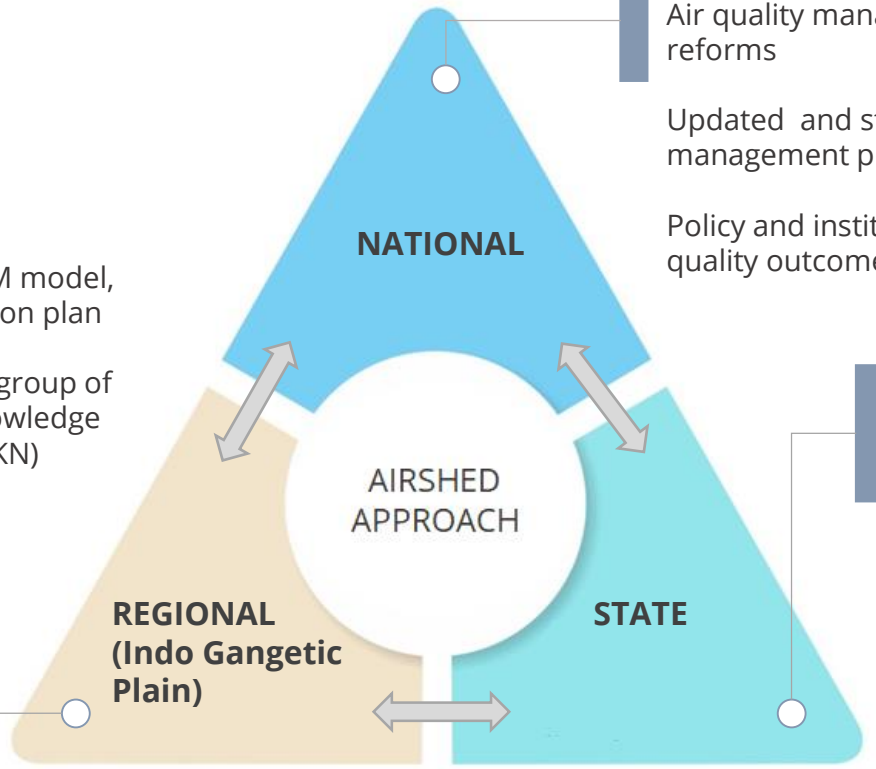
Construction Dust:

- Coverage of construction sites, placement of wind breakers, water sprinkling systems, etc.

World Bank India TA: Supports National Clean Air Action Plan (NCAP) and next steps

Establish IGP AQM model, and regional action plan

Support IGP sub-group of the National Knowledge Network (NKN)



Build capacities and deepen knowledge for Air quality management and planning and reforms

Updated and standardized air quality management planning guidelines

Policy and institutional reforms for better air quality outcomes

Develop state level action and investment plans

Implementation support for Clean Air Action Plans

Important new Policy Reforms

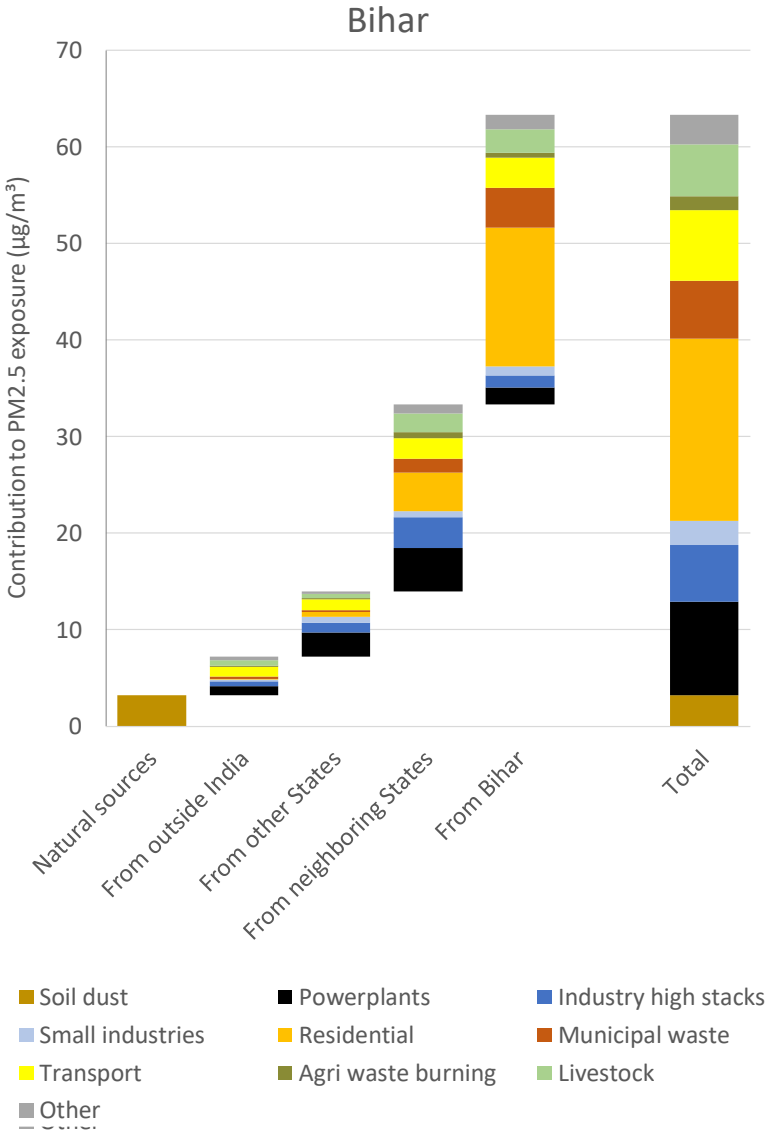
Performance based funds
to tackle air pollution announced for the first time (up to USD $3.6 billion, 6 years)

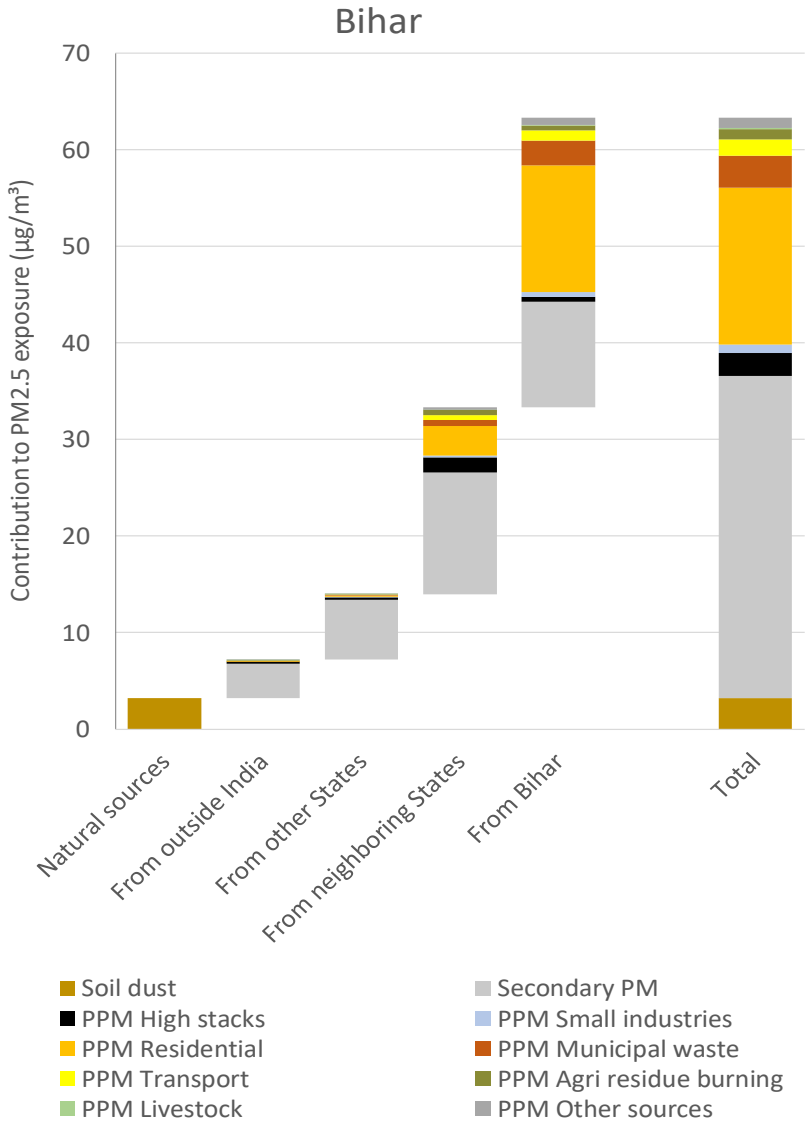
Air Commission established
to reduce air pollution in the Delhi NCR and adjoining states – acknowledging airshed† management (interstate and multi sector)

Inform and leverage innovative financing mechanisms, including World Bank DPF and PforR instruments for implementation of investment plans

AIR POLLUTION: A MULTI-SECTORAL, MULTI-JURISDICTIONAL CHALLENGE
Over 50% of sources can come from secondary emissions

Neighboring states, and urban and rural sources contribute to pollution in Bihar*





Precursor gases (NOx, SO) responsible for secondary PM formation

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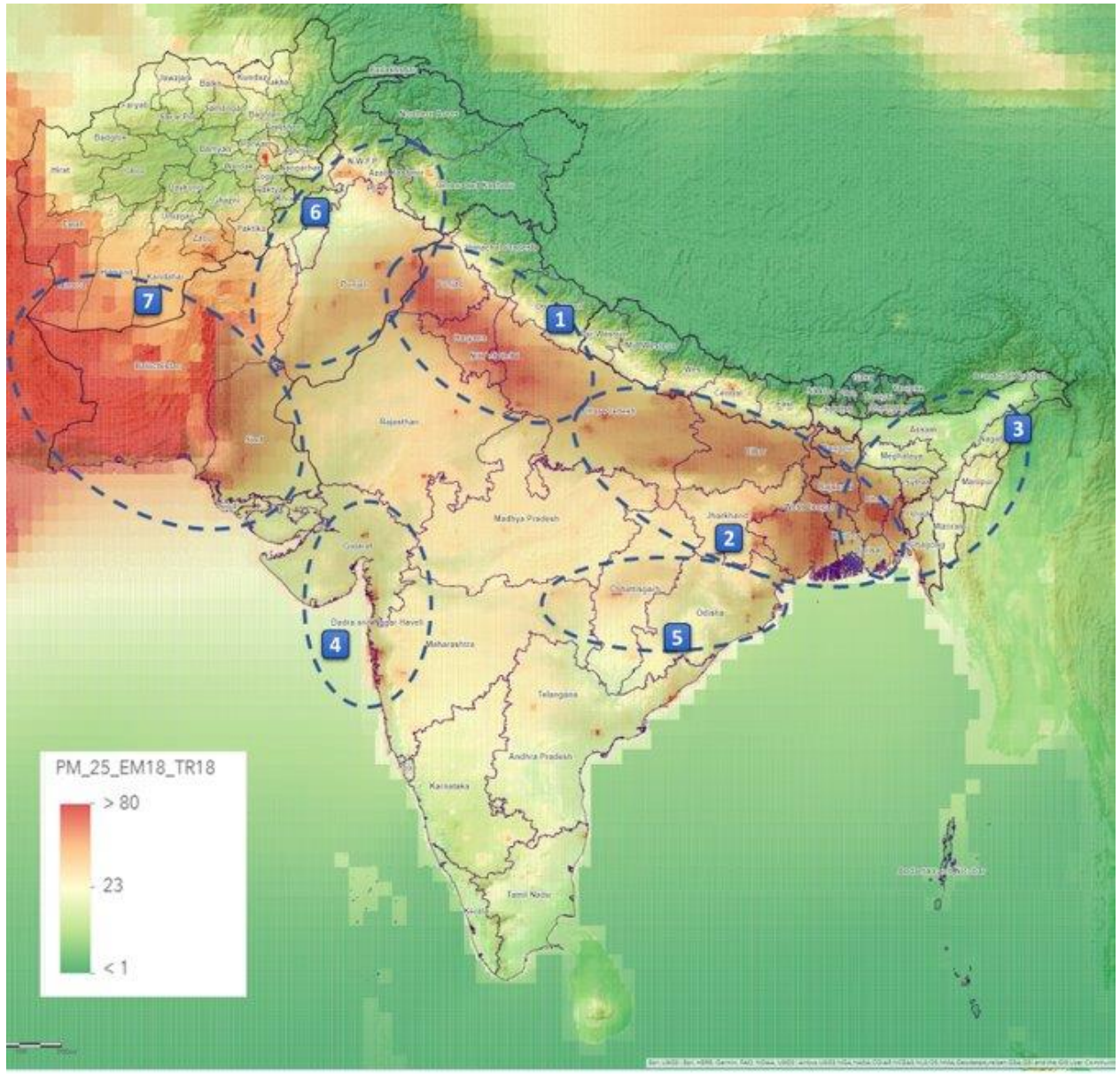
Some emerging findings on airsheds in South Asia

Critical airsheds with high $PM_{2.5}$ concentration:

- **1-2: West/Central Indo-Gangetic Plain (IGP):** India extends into Pakistan and Central/East IGP extends into Nepal and Bangladesh.
- **3: Brahmaputra** (Bangladesh and India).
- **4-5: Middle India:** East Gujarat/West Maharashtra and Odisha/ Chhattisgarh
- **6: Northern/Central Hindus:** Pakistan (Punjab), India (Punjab), part of Afghanistan
- **7: Southern Hindus:** South Pakistan, West Afghanistan extends into East Iran).

→ **Collaboration is needed between jurisdictions** (states/provinces) within the airsheds

→ Airsheds 1, 2, 3, 6 and 7 go across **international jurisdictions**



What it takes: A Large multi-Sector Bank staff team + International and Indian experts are mobilized to support India

SECTOR	WORLD BANK MEMBERS
Environment (Core team)	Karin Shepardson, Jostein Nygard, Sharlene Chichgar, Neha Sharma, Sayantan Sarkar, Ishaa Srivastava, Gaurav Joshi, Pyush Dogra, Urvashi Narain
Agriculture/ Rural	Priti Kumar, Manivannam Pathy
Energy	Power Sector: Ashok Sarkar, Surbhi Goyal; Natural Gas and Fuels; Renewables and Clean Energy: Simon Stolp, Michael Stanley
Climate Change	Chandra Shekhar
Transport	Gerald Olivier, Reenu Aneja
Urban/ Governance	Sumila Gulyani, Abhijit Ray, Farah Zahir, Pedro Arizti
Communication	Sudip Mazumdar, Nitika Mehta
Health	Suresh Mohammad
MSME	Charu Jain, Vishal Agarwal

INTERNATIONAL EXPERTS	AFFILIATION
Markus Amann	IIASA/Austria
Laurence Rouli	INERIS/France
Alan Lloyd	CARB/ICCT/USA
Franck Dauge	Norwegian Institute for Air Research
Steiner Larssen	World Expert on air pollution studies
Rohini Pande	Yale University

INDIAN EXPERTS	AFFILIATION
Prof. Sagnik Dey	IIT Delhi
Dr. Shrikant Baldi (IAS)	(Retd) Former Chief Secretary and ACS Finance, Himachal Pradesh
Dr. Prasad Modak	Head Ekonnect knowledge foundation
Dr. Meena Sehgal	Air pollution and public health expert, TERI